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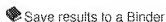

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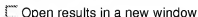


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# 1 [Applications of storage mapping optimization to register promotion](#)

Patrick Carribault, Albert Cohen

June 2004 | CS '04: Proceedings of the 18th annual international conference on Supercomputing

Publisher: ACM

 Full text available: pdf(268.41 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Storage mapping optimization is a flexible approach to folding array dimensions in numerical codes. It is designed to reduce the memory footprint after a wide spectrum of loop transformations, whether based on uniform dependence vectors or more expressive ...

Keyw ords: array contraction, array folding, blocking, itanium, pattern matching, register promotion, scheduling, string matching, tiling

# 2 [VLIW instruction scheduling for minimal power variation](#)

Shu Xiao, Edmund M.-K. Lai

September 2007 ACM Transactions on Architecture and Code Optimization (TACO), Volume 4 Issue 3

Publisher: ACM

 Full text available: pdf(796.99 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The focus of this paper is on the minimization of the variation in power consumed by a VLIW processor during the execution of a target program through instruction scheduling. The problem is formulated as a mixed-integer program (MIP) and a problem-specific ...

Keyw ords: Instruction scheduling, VLIW processors, power variation reduction

# 3 [Efficient instruction scheduling for delayed-load architectures](#)

Steven M. Kurlander, Todd A. Proebsting, Charles N. Fischer

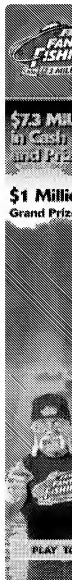
September 1995 ACM Transactions on Programming Languages and Systems (TOPLAS), Volume 17 Issue 5

Publisher: ACM

 Full text available: pdf(2.39 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [cited by](#), [index terms](#), [review](#)

A fast, optimal code-scheduling algorithm for processors with a delayed load of one instruction cycle is described. The algorithm minimizes both execution time and register use and runs in time proportional to the size of the expression-tree. An extension ...

# 4 [Register allocation for irregular architectures](#)





Bernhard Scholz, Erik Eickstein

June 2002 LCTES/ SCOPES '02: Proceedings of the joint conference on Languages, compilers and tools for embedded systems: software and compilers for embedded systems

Publisher: ACM

Full text available: pdf(220.34 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [cited by](#), [index terms](#)

For irregular architectures global register allocation is still a challenging problem that has not been successfully solved so far. The graph-coloring analogy of traditional approaches does not match the needs of register allocation for such architectures ...

**Keyw ords:** boolean quadratic problem, register allocation

## 5 [An efficient technique for exploring register file size in ASIP synthesis](#)



Manoj Kumar Jain, M. Balakrishnan, Anshul Kumar

October 2002 CASES '02: Proceedings of the 2002 international conference on Compilers, architecture, and synthesis for embedded systems

Publisher: ACM

Full text available: pdf(244.65 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [cited by](#), [index terms](#)

Performance estimation is a crucial operation which drives the design space exploration in Application Specific Instruction Set Processors (ASIP) synthesis. The usual approach to estimate performance is to do simulation. With increasing dimensions of ...

**Keyw ords:** ASIP Synthesis, design space exploration, global analysis, instruction scheduling, liveness analysis, register file, register spill, retargetable estimation, storage exploration

## 6 [A general framework to build new CPUs by mapping abstract machine code to instruction level parallel execution hardware](#)



H. C. Wang, C. K. Yuen

November 2005 ACM SIGARCH Computer Architecture News, Volume 33 Issue 4

Publisher: ACM

Full text available: pdf(368.21 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Abstract machines bridge the gap between a programming language and real machines. This paper proposes a general purpose tagged execution framework that may be used to construct a CPU. The CPU may accept code written in any (abstract or real) machine ...

## 7 [Vector instruction set support for conditional operations](#)



J. E. Smith, Greg Faanes, Rabin Sugumar

May 2000 ACM SIGARCH Computer Architecture News, Volume 28 Issue 2

Publisher: ACM

Full text available: pdf(69.24 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [cited by](#), [index terms](#)

Vector instruction sets are receiving renewed interest because of their applicability to multimedia. Current multimedia instruction sets use short vectors with SIMD implementations, but long vector, pipelined implementations have a number of advantages ...

## 8 [Inferring annotated types for inter-procedural register allocation with constructor flattening](#)

Torben Amtoft, Robert Muller



January 2003 TLDI '03: Proceedings of the 2003 ACM SIGPLAN international workshop on  
Types in languages design and implementation

Publisher: ACM

Full text available: pdf(268.82 KB) Additional Information: full citation, abstract, references, index terms

We introduce an annotated type system for a compiler intermediate language. The type system is designed to support inter-procedural register allocation and the representation of tuples and variants directly in the register file. We present an algorithm ...

Keyw ords: certifying compilers, defunctionalization, effects, register allocation, type systems

9 [Instruction scheduling for a tiled dataflow architecture](#)



Martha Mercaldi, Steven Swanson, Andrew Petersen, Andrew Putnam, Andrew Schwerin, Mark Oskin, Susan J. Eggers

October 2006 ACM SIGOPS Operating Systems Review, Volume 40 Issue 5

Publisher: ACM

Full text available: pdf(490.50 KB) Additional Information: full citation, abstract, references, cited by, Index terms

This paper explores hierarchical instruction scheduling for a tiled processor. Our results show that at the top level of the hierarchy, a simple profile-driven algorithm effectively minimizes operand latency. After this schedule has been partitioned ...

Keyw ords: dataflow, instruction scheduling, tiled architectures

10 [On the Complexity of Register Coalescing](#)

Florent Bouchez, Alain Darté, Fabrice Rastello

March 2007 CGO '07: Proceedings of the International Symposium on Code Generation and Optimization

Publisher: IEEE Computer Society

Full text available: pdf(277.05 KB) Additional Information: full citation, abstract, index terms

Memory transfers are becoming more important to optimize, for both performance and power consumption. With this goal in mind, new register allocation schemes are developed, which revisit not only the spilling problem but also the coalescing problem. ...

11 [Spill-free parallel scheduling of basic blocks](#)

B. Natarajan, M. Schiansker

December 1995 MLCRO 28: Proceedings of the 28th annual international symposium on Microarchitecture

Publisher: IEEE Computer Society Press

Full text available: pdf(684.00 KB) Additional Information: full citation, references, cited by, index terms

12 [An optimistic and conservative register assignment heuristic for chordal graphs](#)



Philip Brisk, Ajay Kumar Verma, Paolo Ienne

September 2007 CASES '07: Proceedings of the 2007 international conference on Compilers, architecture, and synthesis for embedded systems

Publisher: ACM

Full text available: pdf(342.34 KB) Additional Information: full citation, abstract, references, index terms

This paper presents a new register assignment heuristic for procedures in SSA Form, whose interference graphs are chordal; the heuristic is called optimistic chordal coloring (OCC). Previous register assignment heuristics eliminate copy instructions ...

Keyw ords: chordal graph, register assignment, static single assignment (ssa) form

### 13 Scientific Computations on Modern Parallel Vector Systems

Leonid Oliker, Andrew Canning, Jonathan Carter, John Shalf, Stephane Ethier

November 2004 SC '04: Proceedings of the 2004 ACM/IEEE conference on Supercomputing

Publisher: IEEE Computer Society

Full text available:  pdf(239.19 KB) Additional Information: full citation, abstract, references, cited by

Computational scientists have seen a frustrating trend of stagnating application performance despite dramatic increases in the claimed peak capability of high performance computing systems. This trend has been widely attributed to the use of superscalar-based ...


### 14 Optimistic coalescing for heterogeneous register architectures

Minwook Ahn, Jooyeon Lee, Yunheung Paek

June 2007 LCTES '07: Proceedings of the 2007 ACM SIGPLAN/SIGBED conference on

Languages, compilers, and tools

Publisher: ACM

Full text available:  pdf(656.33 KB) Additional Information: full citation, abstract, references, index terms

In this paper, Optimistic coalescing has been proven as an elegant and effective technique that provides better chances of safely coloring more registers in register allocation than other coalescing techniques. Its algorithm originally assumes *homogeneous* ...

Keyw ords: compiler, embedded processors, heterogeneous register architecture, register allocation, register coalescing

### 15 Two-level hierarchical register file organization for VLIW processors

Javier Zalamea, Josep Llosa, Eduard Ayguadé, Mateo Valero

December 2000 MICRO 33: Proceedings of the 33rd annual ACM/IEEE international symposium on Microarchitecture

Publisher: ACM


Full text available:  pdf(154.90 KB)  ps(843.85 KB)  Publisher Site Additional Information: full citation, references, cited by, index terms

### 16 Improved spill code generation for software pipelined loops

Javier Zalamea, Josep Llosa, Eduard Ayguadé, Mateo Valero

May 2000 ACM SIGPLAN Notices, Volume 35 Issue 5

Publisher: ACM

Full text available:  pdf(698.06 KB) Additional Information: full citation, abstract, references, cited by, index terms

Software pipelining is a loop scheduling technique that extracts parallelism out of loops by overlapping the execution of several consecutive iterations. Due to the overlapping of iterations, schedules impose high register requirements during their ...

Keyw ords: instruction-level parallelism, register allocation, software pipelining, spill code


### 17 Efficient register and memory assignment for non-orthogonal architectures via graph coloring and MST algorithms

Jeonghun Cho, Yunheung Paek, David Whalley

June 2002 LCTES/ SCOPES '02: Proceedings of the joint conference on Languages, compilers

and tools for embedded systems: software and compilers for embedded systems

Publisher: ACM

Full text available:  pdf(198.37 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [cited by](#), [index terms](#)

Finding an optimal assignment of program variables into registers and memory is prohibitively difficult in code generation for *application specific instruction-set processors* (ASIPs). This is mainly because, in order to meet stringent speed and ...

Keyw ords: compiler, dual memory, graph coloring, maximum spanning tree, memory assignment, non-orthogonal architecture

#### 18 [A retargetable register allocation framework for embedded processors](#)



Jean-Marc Daveau, Thomas Thery, Thierry Lepley, Miguel Santana

June 2004 LCTES '04: Proceedings of the 2004 ACM SIGPLAN/SIGBED conference on

Languages, compilers, and tools for embedded systems

Publisher: ACM

Full text available:  pdf(1.03 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [cited by](#), [index terms](#)

This paper describes the FlexCC2 register allocation framework. FlexCC2 is an optimizing retargetable C compiler for embedded processors, and in particular for DSP processors. Embedded processors often contain features such as irregular and constrained ...

Keyw ords: embedded processors, register allocation

#### 19 [Instruction scheduling for a tiled dataflow architecture](#)



Martha Mercaldi, Steven Swanson, Andrew Petersen, Andrew Putnam, Andrew Schwerin, Mark

Oskin, Susan J. Eggers

November 2006 ACM SIGPLAN Notices, Volume 41 Issue 11

Publisher: ACM

Full text available:  pdf(490.50 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [cited by](#), [index terms](#)

This paper explores hierarchical instruction scheduling for a tiled processor. Our results show that at the top level of the hierarchy, a simple profile-driven algorithm effectively minimizes operand latency. After this schedule has been partitioned ...

Keyw ords: dataflow, instruction scheduling, tiled architectures

#### 20 [Instruction scheduling for a tiled dataflow architecture](#)




Martha Mercaldi, Steven Swanson, Andrew Petersen, Andrew Putnam, Andrew Schwerin, Mark

Oskin, Susan J. Eggers

October 2006 ASPLOS-XII: Proceedings of the 12th international conference on Architectural support for programming languages and operating systems

Publisher: ACM





Full text available:  pdf(490.50 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [cited by](#), [index terms](#)

This paper explores hierarchical instruction scheduling for a tiled processor. Our results show that at the top level of the hierarchy, a simple profile-driven algorithm effectively minimizes operand latency. After this schedule has been partitioned ...

Keyw ords: dataflow, instruction scheduling, tiled architectures

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